



# IAA

# 2<sup>ND</sup> IAA Symposium on Private Human Access to Space

Arcachon/France

May 30<sup>th</sup>  
to June 1<sup>st</sup>  
2011

PRELIMINARY PROGRAMME



Federal Aviation  
Administration



Three years after the success of the first "Symposium on Private Human Access to Space" held in Arcachon in May 2008, the International Academy of Astronautics IAA has the pleasure of reconducting the Symposium in order to identify the progress made since three years on this promising and fascinating topic.

## Conference objectives:

The Symposium aims at addressing all subjects related to the "Space Transportation of Passengers on a Commercial Basis". The overall goal is to identify and evaluate the key topics associated to Private Human Access to Space, mainly concerning Sub-Orbital Missions.

- The Symposium will deal with the major Technical features of the potential solutions, providing participants with a good understanding of the progress made by the entities already engaged in development and those on the verge of doing so,
- The Symposium will address Legal, Regulatory and Insurance aspects, on both certification and safety features of commercial human space flight: current limitations will be identified and future actions will be proposed,
- The Symposium will help identifying the motivations of the potential customers in order to consolidate the foreseen market and associated customers requirements linked to this new branch of Access to Space,
- The Symposium will deal with the constraints associated to human flights in the frame of commercial initiatives, mainly in the physiological aspects, the psychological ones and the associated ergonomics constraints,
- The Symposium will deal with ground infrastructures, future spaceports, space tourism bases together with associated services such as side activities and entertainment.

## A PLACE FOR EXCHANGES AND NETWORKING

The International Academy for Astronautics has the ambition of making this Symposium a key focal point for all partners interested in the subject, researchers, industrials, entrepreneurs, space companies, agencies, universities, government representatives, associations, academies...

The conference will propose outstanding communications on all those topics, but will also reserve time for networking and fruitful exchange among all delegates.

A special attention will be given to students in order to guarantee presence of fresh blood who will undertake in near future the dreams of older sceptics...

## Language

Papers will be presented in English. Simultaneous translation facilities will not be available.

# PRELIMINARY PROGRAMME

May 30<sup>th</sup>, 2011. Arcachon

8h00-9h00

Registration

S1- PLENARY SESSION 1 – Chairperson: C. BONNAL

9h00-9h20

Welcome Address

- Christophe BONNAL, International Academy of Astronautics IAA - Senior Expert, CNES - FRANCE
- Jean-Michel CONTANT, Secretary General, International Academy of Astronautics, FRANCE
- Thierry LEVEUGLE, President, ARA and Vice-President, Head of Research and Technologies, ASTRIUM ST - FRANCE

9h20-9h40

Keynote Introduction Speech

- Christophe BONNAL, International Academy of Astronautics IAA - Senior Expert, CNES - FRANCE

9h40-10h00

Keynote Introduction Speech

- Jean-Pierre HAIGNERE, Astronaut and President, Astronaut Club Européen (ACE) - FRANCE

10h00-10h20

Keynote Introduction Speech

- Simonetta DI PIPPO, Director, Human Spaceflight Directorate, ESA

10h20 - 10h40

SPACE TOURISM; ITS HISTORY, FUTURE AND IMPORTANCE

- Derek WEBBER, Washington DC Director, Spaceport Associates - USA

10h40-11h10

Coffee Break

S2 - PLENARY SESSION 2 – Chairperson: D. WEBBER

11h10-11h30

Establishing the Evidence Base to Support Safe Flights for Passengers  
on Suborbital Spaceflights

James M. VANDERPLOEG, Chief Medical Officer, Virgin Galactic, University of Texas - USA

11h30-11h50

ESA Human Rating Tailoring for Sub-Orbital Vehicles  
Tommaso SGOBBA, Head of ESA Independent Safety Office, ESA

11h50-12h10

Understanding the Demand for Commercial Human Spaceflight:  
Revisiting the Futron Space Tourism Market Study  
Jeffrey FOUST, Senior Analyst, Futron Corporation - USA

12h10-12h30

Legal Aspects General Overview  
Tanja MASSON ZWAAN, Deputy Director, Institute of Air and Space Law, IAASL  
President, International Institute of Space Law, IISL - THE NETHERLANDS

12h30-12h50

"Keynote Address"  
Stephen ATTENBOROUGH, Commercial Director, VIRGIN GALACTIC - UNITED KINGDOM

12h50-14h20

Lunch

## May 30<sup>th</sup>, 2011. Arcachon

### S3 - LEGAL - REGULATORY - INSURANCE 1

Chairperson: F. VON DER DUNK

- 14h20-14h40 The Rules of Commercial Engagement: How Does The United States Regulate Private Human Spaceflight And What Does It Mean?  
Maria-Vittoria CARMINATI, Weil, Gotshal & Manges, LLP - USA
- 14h40-15h00 The Integrated Approach – Regulating Private Human Spaceflight as Space Activity, Aircraft Operation, and High-Adventure Tourism  
Frans G. VON DER DUNK, University of Nebraska-Lincoln, College of Law - USA
- 15h00-15h20 Legal and Political Approaches to Obtaining Commercial Human Suborbital Spaceflight Launch Authorization from the Airport of Saragossa, Spain  
Garrett SMITH, President, Cosmica Spacelines SAS - FRANCE
- 15h20-15h40 Technical Regulation in the Frame of the French Space Act  
Bruno LAZARE, General Inspection and Quality Directorate, CNES - FRANCE
- 15h40-16h00 Accomodating Sub-Orbital Flights into the European Regulatory Framework  
Jean-Bruno MARCIACQ, Project Certification Manager; European Aviation Safety Agency EASA - GERMANY

### S4 - SYSTEM 1

Chairperson: M. CALABRO

- Geometry Evolution of the Rocket Plane For Space Tourist Application  
Agnieszka KWIEK, Warsaw University of Technology - POLAND
- Design of the Primary Propulsion System of a Suborbital Manned Vehicle  
Lauren NGUYEN-DUC, SNECMA - FRANCE
- Characterization of HTPB-Based Solid Fuels for Hybrid Propulsion: Performance, Mechanical Properties, and Pollution  
Luigi DE LUCA, Head, SPLab, Politecnico di Milano - ITALY
- High Yield Solid Propulsion Reaction Control System for Space Plane  
Stéphane HENRY, SNPE Matériaux Energétiques - FRANCE
- Combustion of Metal Agglomerates in Solid Rocket Core Flow  
Filippo MAGGI, SPLab, Politecnico di Milano - ITALY

## 16h00-16h30

## Coffee Break

### S5 - LEGAL - REGULATORY - INSURANCE 2

Chairperson: J.B. MARCIACQ

- 16h30-16h50 International Interest in Space Assets under Cape Town Convention  
Lutfie ARNETOVA, Institute of Air and Space Law - Leiden University - THE NETHERLANDS
- 16h50-17h10 Authorization, Supervision, Obligation: State Modalities for Fulfilling Article VI and Their Impact on Private Human Access to Outer Space  
P. J. BLOUNT, University of Mississippi School of Law - USA
- 17h10-17h30 The 2011 Texas Spaceflight Liability Law Efficient Regulation for the Era of Commercial Spaceflight  
Christopher D. JOHNSON, LL.M. - USA

### S6 - SYSTEM 2

Chairperson: G. SMITH

- The Interior Architecture of the Galactic Suite Spaceresort Based in ATV Technologies  
Marc ZABALLA, GALACTIC SUITE - SPAIN
- Aerodynamic and Ballistic Design of Tourist Class Reusable Space Vehicles  
Tatiana AGEYEVA, Bauman Moscow State Technical University - RUSSIA
- Astrium Suborbital Spaceplane Project and Aquitaine for Final Assembly Line location – Jean-François GIRE, Head of Aeroparc agency - FRANCE

## May 30<sup>th</sup>, 2011. Arcachon

### S5 - LEGAL - REGUL. - INSURANCE 2 (Cont'd)

Chairperson: J.B. MARCIACQ

17h30-17h50 Practical Solutions for the Regulation of Private Human Suborbital Flight: a Critical Analysis

Tanja MASSON ZWAAN, Deputy Director, Institute of Air and Space Law, President, IISL - THE NETHERLANDS

### S6 - SYSTEM 2 (Cont'd)

Chairperson: G. SMITH

Commercial Spaceflight Projects in Spain: Challenges and Perspectives  
Rafael Harillo GÓMEZ-PASTRANA, STARDUST CONSULTING - SPAIN

19h30

## Conference Dinner

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### S7 - LEGAL - REGULATORY - INSURANCE 3

Chairperson: D. BENSOUSSAN

9h00-9h20 Characterization of Suborbital Vehicles as Aircraft or Space Objects: a Critical Analysis

Rafael MORO, Head of Legal Affairs, Orbspace Engineering - AUSTRIA

9h20-9h40 Aviation or Space Policy – New Challenges for the Insurance Sector on Commercial Human Space Flight  
Ana Cristina GALHEGO ROSA, Leiden University - THE NETHERLANDS

9h40-10h00 Space Access Inc.: Risks and Opportunities  
Denis BENSOUSSAN, Hiscox - FRANCE

10h00-10h20 International Jurisdiction, Recognition and Enforcement of Resolutions in Liability Insurance Matters Related to Accidents Occurred During Private Commercial Activities in Outer Space  
Jordi SANDALINAS, Attorney at Law, Law Faculty of Jaen - SPAIN

### S8 - SYSTEM 3

Chairperson: A. DUPAS

Astrium Suborbital Spaceplane for 0-g Missions

Christophe CHAVAGNAC, Suborbital Spaceplane Project: Manager & Chief Engineer, ASTRIUM Space Transportation - FRANCE

A Stairway to Commercial Human Space Flight in Japan  
Misuzu ONUKI, Space Frontier Foundation - JAPAN

Kiruna High School and Spaceport Sweden Cooperation  
Christina SÖDERLUND, Principal, Kiruna Space High School - SWEDEN

Utilisation of Suborbital Human Space Flight Vehicles for Science and Research Activities

Philippe BERTHE, Human Spaceflight Directorate, ESA / ESTEC - ESA

10h20-11h00

## Coffee Break

### S9 - LEGAL - REGULATORY - INSURANCE 4

Chairperson: T. SGOBBA

11h00-11h20 Insuring the Commercial Human Flights  
Philippe MONTPERT, Willis Inspace - FRANCE

11h20-11h40 CSLAA and FAA's Rules: Incorporating a 'Risk Management' Strategy to Minimise Space Flight Risks  
Shane CHADDHA, School of Law, University of Manchester - UNITED KINGDOM

### S10 - SYSTEM 4

Chairperson: M. GRIMARD

The Student Aerospace Challenge Initiative  
Jean-Pierre HAIGNERE, Astronaut and President, Astronaut Club Européen (ACE) - FRANCE

The Work of the Ultra-Low-Cost Space Transportation Sub-Committee of the Japanese SPS Research Society  
Patrick COLLINS, Azabu University JAPAN

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S9 - LEGAL - REGUL. - INSURANCE 4 (Cont'd)  
Chairperson: T. SGOBBA

11h40-12h00 Considering the Unthinkable – a Review and Discussion of Current International Law and Suggestions Regarding How we Deal with Catastrophic Incident in Space  
Darcy BEAMER-DOWNIE, Airclaims Ltd - UNITED KINGDOM

12h00-12h20 Lack of Encouragement for Private Human Access to Space in International Space Law  
Hadi MAHMOUDI, Faculty Member of Aerospace Research Institute - IRAN

S10 - SYSTEM 4 (Cont'd)  
Chairperson: M. GRIMARD

Generic Safety Analysis of Suborbital Flight  
Aron LENTSCH, President, Orbspace Engineering - AUSTRIA

Establishing Commercial Spaceflight in Sweden – Spaceport Sweden as a Platform for Collaboration and Innovation Across Creative Industries  
Karin NILSDOTTER, Director, Spaceport Sweden - SWEDEN

12h20-14h00

Lunch

S11 - MEDICAL 1  
Chairperson: R. GERZER

14h00-14h20 «:envihab», a New Facility in Central Europe that will Facilitate Medical Examination, Training and Education of Future Private Spaceflight Participants  
Rupert GERZER, Head of Institute of Aerospace Medicine German Aerospace Center, DLR - GERMANY

14h20-14h40 Medical Informed Consent in U.S. Suborbital Commercial Space Flight  
Maria-Vittoria CARMINATI, Weil, Gotshal & Manges, LLP - USA

14h40-15h00 ESA Human Rating Requirements  
Maite TRUJILLO, ESA / ESTEC Safety Department - ESA

15h00-15h20 Suborbital Commercial Space Flight Crewmember Medical Issues  
Mark R. CAMPBELL, Dr Mark R. CAMPBELL MD - USA

S12 - BUSINESS  
Chairperson: P. EYMAR

Why should they Invest? When should they Leave the Program?  
Patrick EYMAR, CEO, N4E - FRANCE

ASTRIUM - Space Suborbital Tourism Market Survey – Thierry LE GOFF, Strategy and Business Development, Head of M&A, ASTRIUM - FRANCE

Newspace – Delivering on the Dream  
Dave SALT, Senior Consultant, VEGA Space GmbH - GERMANY

Joint Ownership of Suborbital Vehicles – Applying Private Aircraft Business Models  
Garrett SMITH, President, Cosmica Spacelines SAS - FRANCE

15h20-16h00

Coffee Break

S13 - MEDICAL 2  
Chairperson: J.M. VANDERPLOEG

16h00-16h20 Commercial Suborbital Spaceflight: A New Challenge for the Consulting Flight Surgeon  
Götz KLUGE, DLR Institute of Aerospace Medicine - GERMANY

S14 - SYSTEM 5  
Chairperson: J.L. WIBAUX

Point-to-Point People with Purpose (Exploring the Possibility of a Commercial Traveler Market for Point-to-Point Suborbital Space Transportation)  
Derek WEBBER, Washington DC Director, Spaceport Associates - USA

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### S13 - MEDICAL 2 (Cont'd)

Chairperson: J.M. VANDERPLOEG

16h20-16h40 Initial Cabin Environment Values  
Klaus LEGNER, Orbspace Engineering  
AUSTRIA

16h40-17h00 Crew Health Support for an Orbital  
Commercial Space Company  
Jonathan CLARK, Excalibur Almaz - USA

17h00-17h20 Kids in Space:  
"Are we Nearly There Yet?"  
Igor FIERENS, Paediatrician - UNITED KINGDOM

17h20-17h40 Physical Aptitude and Space Flight (with an  
Emphasis on Cardio-Respiratory Fitness)  
Frédéric TOGNELLA, MD - FRANCE

### S14 - SYSTEM 5 (Cont'd)

Chairperson: J.L. WIBAUX

The Development of the SpaceLiner in  
the FAST20XX Program  
Arnold VAN FOREEST, Institute of Space  
Systems, DLR - GERMANY

Business Plan Elements for commercial  
Point-to-Point (P2P) Flights  
Walter PEETERS, Dean, International Space  
University (ISU), and IISC - FRANCE

A Potential Route to Certification of  
SKYLON for Public Flights  
Mark HEMPSELL, Future Programmes Director,  
Reaction Engines Limited - UNITED KINGDOM

New Concept of Space Travel and its  
Feasibility Study – S.V ANTONENKO,  
Khronichev State Research and Production  
Space Center - RUSSIA

## June 1<sup>st</sup>, 2011. Arcachon

### ROUND TABLE 1 – Moderator: T. MASSON-ZWAANL

9h00-9h50 Round Table on Legal - Regulatory - Insurance Aspects

### S15 - PLENARY 3 - CONCEPTS – Chairperson: P. COUE

9h50-10h15 XCOR Aerospace Commercial Reusable Launch Vehicle Development and Status  
Khaki Rodway McKEE, Senior Program Manager, XCOR Aerospace - USA

10h15-10h40 K-1000: A Suborbital Spacecraft System  
Pierre WILHELM, Ecole Polytechnique Fédérale de Lausanne - SWITZERLAND

10h40-10h55

## Coffee Break

### S15 - PLENARY 3 - CONCEPTS (Cont'd) – Chairperson: P. COUE

10h55-11h20 Spaceplanes, Spaceports and the Transition to a Global  
Aerospace Transportation System  
Charles J. LAUER, President, Rocketplane Global, Inc. - USA

11h20-11h45 Astrium Suborbital Spaceplane Project: Validation of one Space Transient Phase  
Christophe CHAVAGNAC, Suborbital Spaceplane Project Manager & Chief Engineer, ASTRIUM Space Transportation - FR

11h45-12h10

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### ROUND TABLE 2 – Moderator: J.L. WIBAUX

12h10-13h00 Private Astronaut Candidates: Motivation, Expectations and Fears  
Astronaut VIP - Industrials - Candidates

### CLOSING SESSION

13h00-13h10 Closing & Final Address  
– Christophe BONNAL, International Academy of Astronautics IAA - Senior Expert, CNES - FRANCE  
– Jean-Michel CONTANT, International Academy of Astronautics, Secretary General - FRANCE

13h10-14h30

## Farewell Lunch

# 2<sup>ND</sup> IAA Symposium on Private Human Access to Space

## GENERAL INFORMATION

### Location

Palais des Congrès d'Arcachon  
Boulevard Veyrier Montagnères  
33120 Arcachon – France  
(3/4 hour drive from Bordeaux International Airport)

### Arcachon

Arcachon in May should be terrific!  
The conference center is second to none. Located on the beach of the Arcachon Bay, there you will profit by famous oysters, world known Bordeaux wine, and all possibilities of local entertainment.

<http://congres.arcachon.com>

### Secretariat

All correspondance and inquiries should be sent to the conference secretariat.

Avantage Aquitaine – 42, rue de Tauzia  
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**More information on our web page:**  
[www.avantage-aquitaine.com](http://www.avantage-aquitaine.com)

### PROGRAMME COMMITTEE

**President:** Christophe BONNAL, IAA

### PROGRAMME COMMITTEE

**Melchor ANTUÑANO**, FAA

**Max CALABRO**, The Inner Arch

**Philippe COUÉ**, Dassault-Aviation

**Alain DUPAS**, John Hopkins University

**Patrick EYMAR**, N4E

**Rupert GERZER**, DLR

**Max GRIMARD**, Astrium

**Tanja MASSON-ZWAAN**, IISL

**Tommaso SGOBBA**, ESA

**John SLOAN**, FAA

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